

Selected Bibliography of Statistical Literature: Supplement, 1958-1960

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This is the last of a series of bibliographies that deal with various specific subjects in the field of statistics. The preceding six bibliographies of the series gave references for the period from 1930 to 1957. This one is intended to supplement the others by bringing them up to date through 1960. The references are arranged under the various subject titles published earlier in this series.

The purpose of this series of bibliographies is to provide a list of references in several specific subjects within the very large field of probability and mathematical statistics. The purpose of this last one in the series is to supplement the others by including references to related material published in 1958, 1959, and 1960. We felt that to carry this effort beyond 1960 would be redundant and overlapping. Within the last few years a number of bibliographic resources have become available in varying degrees of generality and specialization either as one-volume lists of references or as continuing abstract services. Although my intention is not to give a bibliography of bibliographies and abstract services, I shall mention several significant ones to show that as the statistical literature grows to a staggering amount, so also does interest grow in the construction of reference material to make the statistician aware of the existence of papers relevant to his field and to enable him to trace them.

Most noteworthy among the bibliographies is the *Bibliography of Statistical Literature 1950-1958* by Maurice G. Kendall and Alison G. Doig. Professor Kendall promises that two more volumes, also covering the general field of statistical method and theory, will follow to cover the period from the 16th century up to 1950. A number of excellent bibliographies that specialize in particular phases of statistics have also been published. Two of these cover subjects that were intended for inclusion within this present series. However, in each case the author did a more thorough search of the literature for his particular area than could have been handled here. These are: I. Richard Savage, *Bibliography of Nonparametric Statistics*, Harvard University Press, Cambridge, Mass., 1962; and J. Edward Jackson, *Bibliography on Sequential Analysis*, Jour. Amer. Stat. Assoc. Vol. 55, 561-580, Sept. 1960.

A great service to the statistician is provided by the International Statistical Institute through its two abstracting journals: *International Journal of Abstracts—Statistical Theory and Methods*, published quarterly since 1959; and *International Journal of Abstracts—Statistical Methods in Industry* published three times a year since 1954. Another digest service in applied statistics is *Quality Control and Applied*

Statistics published by Interscience Publishers, Inc., New York.

As was explained in other sections of this series, we have limited the source material to the two large reviewing journals—*Zentralblatt für Mathematik* for the years 1930-1939, and *Mathematical Reviews* from 1940-1960. All abstracts under the general headings of "Probability" and "Mathematical Statistics" are transferred to cards. These are arranged alphabetically by author and placed in a file. This collection of abstracts is maintained on a current basis in the NBS Statistical Engineering Laboratory. The abstracts are coded into many categories of subject matter following generally, but with some minor deviations, the classification scheme of *Mathematical Reviews*. One abstract may be classified under several subjects; hence it may appear in more than one place in this series. References were transcribed from the abstracts by means of punched cards and titles were added to prepare the following selected subjects for publication in the *NBS Journal of Research*:

Correlation and Regression Theory, Vol. 64B, pp. 55-68, January-March 1960;
Time Series, Vol. 64B, pp. 69-76, January-March 1960;
Limit Theorems, Vol. 64B, pp. 175-192, July-September 1960;
Markov Chains and Stochastic Processes, Vol. 65B, pp. 61-93, January-March 1961;
Frequency Functions, Moments, and Graduation, Vol. 66B, pp. 15-28, January-March 1962;
Theory of Estimation and Testing of Hypotheses, Sampling Distributions, and Theory of Sample Surveys, Vol. 66B, pp. 109-151, July-September 1962.

Most of the abstracts deal with statistical theory and methodology with applications usually appearing only when they illustrate something new or novel in theory or method. The classification scheme for the *Mathematical Reviews* has undergone revision from time to time and in the last several years the category "Correlation and Regression Theory" was eliminated entirely and articles on these subjects placed among the other classifications as appropriate.

The references given here contain the following information taken directly from the abstracts:

Author: The author's surname, followed by initials only. In the case of multiple authorships, the journal reference appears with each author's name, but the title of the paper appears with the first author only. The symbol ♦ preceding the surname denotes multiple authorship.

Title: Exactly as in the reviewing journal. Titles of separately bound publications (books, reports, theses, etc.) are in italics, followed by the publisher.

Reference to literature: The name of the journal in italics and the number of the volume in bold face, are followed by initial page number.

Date of publication: The next figure, in parentheses shows the date when the article or book itself appeared.

M (for *Mathematical Reviews*) and Z (for *Zentralblatt für Mathematik*) are followed by the volume number and page number of the reviewing journal in which the abstract appears.

Time Series

Aki, K., Space and time spectra of stationary stochastic waves, with special reference to microtremors, *Bull. Earthquake Res. Inst. Tokyo* **35**, 415 (1957).
M **19**, 783

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M **19**, 475

Anderson, T. W., On asymptotic distributions of estimates of parameters of stochastic difference equations, *Ann. Math. Statist.* **30**, 676 (1959).
M **21**, 1131

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M **21**, 747

Balakrishnan, A. V., On a characterization of covariances, *Ann. Math. Statist.* **30**, 670 (1959).
M **21**, 1245

Bass, J., Sur certaines classes de fonctions admettant une fonction d'autocorrélation continue, *C. R. Acad. Sci. Paris* **245**, 1217 (1957).
M **20**, 468

♦ Bass, J., Moyennes de sommes trigonométriques et fonctions d'autocorrélation, *C. R. Acad. Sci. Paris* **245**, 2457 (1957).
M **20**, 468

♦ Bertrandias, J., (See J. Bass) *C. R. Acad. Sci. Paris* **245**, 2457 (1957).

♦ Blackman, R. B., The measurement of power spectra from the point of view of communications engineering. I., *Bell System Tech. J.* **37**, 185 (1958).
M **21**, 323

♦ Blackman, R. B., The measurement of power spectra from the point of view of communications engineering. II., *Bell System Tech. J.* **37**, 485 (1958).
M **21**, 323

♦ Blackman, R. B., *The measurement of power spectra: From the point of view of communications engineering* (Dover Publications, Inc., New York, 1959).
M **21**, 323

♦ Bochner, S., A limit theorem for the periodogram, *Ann. Math. Statist.* **29**, 1198 (1958).
M **20**, 1208

Breny, H., Recherches sur la théorie statistique des faisceaux de fibres, *Mém. Soc. Roy. Sci. Liège* (4) **17**, 131 pp. (1957).
M **19**, 778

Broadbent, S. R., The inspection of a Markov process, *J. Roy. Statist. Soc., Ser. B* **20**, 111 (1958).
M **20**, 1022

Campbell, L. L., On the use of Hermite expansions in noise problems, *J. Soc. Indust. Appl. Math.* **5**, 244 (1957).
M **19**, 1098

Cartwright, D. E., On estimating the mean energy of sea waves from the highest waves in a record, *Proc. Roy. Soc. London, Ser. A* **247**, 22 (1958).
M **20**, 231

Caughey, T. K., Response of Van der Pol's oscillator to random excitation, *J. Appl. Mech.* **26**, 345 (1959).
M **21**, 1239

Charnock, H., Notes on the specification of atmospheric turbulence, *J. Roy. Statist. Soc., Ser. A* **120**, 398 (1957).
M **19**, 1099

Craddock, J. M., An analysis of the slower temperature variations at Kew Observatory by means of mutually exclusive band pass filters, *J. Roy. Statist. Soc., Ser. A* **120**, 387 (1957).
M **19**, 1099

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M **19**, 1206

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M **20**, 1022

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M **20**, 1208

Dorogovcev, A. Ya., Statistical analysis of a stochastic difference equation, *Dopovidi Akad. Nauk Ukrain. RSR* **1959**, 120 (1959).
M **21**, 837

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M **21**, 447

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M **20**, 342

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M **21**, 1131

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A. Stochastic Processes—General Theory

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(Paper 67B2-97)

Publications of The National Bureau of Standards*

Selected Abstracts

Perturbation method in a problem of waveguide theory. D. Fox and W. Magnus, *J. Research NBS 67D* (Radio Prop.) No. 2, 189 (Mar.-Apr. 1963). 70 cents.

The reflection coefficient for the basic mode in a widening, straight, two-dimensional waveguide is computed for small wave numbers by using the perturbation method with the electrostatic case as the unperturbed case. The problem is treated as a perturbed infinite system of inhomogeneous linear equations, and it is shown that the matrix of the unperturbed system (which corresponds to the electrostatic case) can be inverted explicitly by using conformal mappings and physically unrealistic modes. Questions of convergence are discussed, and other examples for application of the method are indicated.

Some wave functions and potential functions pertaining to spherically stratified media. C. T. Tai, *J. Research NBS 67D* (Radio Prop.) No. 2, 199 (Mar.-Apr. 1963). 70 cents.

The wave functions pertaining to a bilinearly stratified medium are presented in this paper. Solutions to the equation $\nabla \cdot [\kappa(r) \nabla \Psi] = 0$ have been investigated for several profiles of $\kappa(r)$. An analysis is given to the equation $\nabla \cdot [\kappa \nabla \Psi] = -\rho/\epsilon_0$ which arises from the formulation of the quasi-static electric field in a homogeneous anisotropic medium.

Relative convergence of the solution of a doubly infinite set of equations. R. Mittra, *J. Research NBS 67D* (Radio Prop.) No. 2, 245 (Mar.-Apr. 1963). 70 cents.

The paper deals with the relative convergence of a doubly-infinite set of equations pertaining to a boundary value problem in a waveguide. It is shown that the solution for the equations converges differently for different choices of the combination of the number of equations from the two sets. This is demonstrated by studying the convergence properties of the truncated set of equations as the number of equations is made indefinitely large. It is proven that the solution for the reflection coefficient becomes identical with the exact solution only with a particular choice of the ratio of the equations. This choice of the unique ratio is also shown to be consistent with the edge condition.

Realistic diatomic potential function. H. W. Woolley, *J. chem. Phys.* **37**, No. 6, 1307-1316 (Sept. 1962).

An examination of recently published data for diatomic molecules as obtained by the Rydberg-Klein-Rees method has suggested a useful form for the potential-energy function. This form provides an inverse-power dependence at large distance and an extrapolation to infinity at the extreme of close approach. Relations are given to permit an arbitrarily close fit of observed spectroscopic constants. Theoretical formulas covering seven new $Y_{[ij]}$'s of the Dunham-Sandeman series for the rotating vibrator are included. Potential curves for H_2 and HF are shown as examples, including effects of previously determined higher-order spectroscopic constants. Other applications of the new potential are also discussed.

Tests for contingency tables and Markov chains. S. Kullback, M. Kupperman, and H. H. Ku, *Technometrics* **4**, No. 4, 573-608 (Nov. 1962).

A number of useful tests for contingency tables and finite stationary Markov chains are presented in this paper based on the use of the notions of information theory. A consistent and simple approach is used in developing the various test procedures and the results are given in the form of analysis-of-information tables. Beginning with tests of hypotheses for a one-way table, tests of hypotheses of specified probabilities, independence, conditional independence, homogeneity of classifications, and symmetry are developed for contingency tables of two, three, four, and higher order classifications.

For the Markov chains, the tests include the hypotheses of a specified matrix of transition probabilities, Markovity, and homogeneity of several realizations of Markov chains. Worked examples are given throughout the paper. A table of $2n \ln n$ for $n=1$ (1) 10,000 is appended for use in computation.

A molecular-orbital study of the geometry of HO_2 . M. E. Boyd, *J. Chem. Phys.* **37**, No. 6, 1317-1325 (Sept. 1962).

Determination of the energy of HO_2 as a function of the HO_1O_2 angle for fixed values of $R(H-O_1)$ and $R(H-O_2)$ has been carried out using LCAO-MO-SCF calculations on closed-shell ions. All one-electron and one- and two-center two-electron integrals used were evaluated accurately while three-center integrals were approximated. An isosceles-triangle configuration is favored by these calculations and gives a value of the ionization potential of 9.5 eV and dissociation energy of 4.4 eV, consonant with experimental results. Approximation by means of ionic calculations used here is shown to be valid for the purposes of this discussion.

Other NBS Publications

J. Research NBS 67A (Phys. and Chem.), No. 2 (Mar.-Apr. 1963) 70 cents.

Third spectrum of palladium (Pd III). A. G. Shenstone.
Broadening of the rotational lines of carbon monoxide by HCl and argon. R. J. Thibault, J. H. Jaffe, and E. K. Plyler.

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Quantitative metallography with a digital computer: application to a Nb-Sn superconducting wire. G. A. Moore and L. L. Wyman.

Moiré fringes produced by a point projection X-ray microscope. S. B. Newman.

Cyclic polyhydroxy ketones. I. Oxidation products of hexahydroxybenzene (benzenehexol). A. J. Fatiadi and H. S. Isbell.

Effect of pressure and temperature on the refractive indices of benzene, carbon tetrachloride, and water. R. M. Waxler and C. E. Weir.

Pressure-density-temperature relations of fluid para hydrogen from 15 to 100 °K at pressures to 350 atmospheres. R. D. Goodwin, D. E. Diller, H. M. Roder, and L. A. Weber.

A method for determining the elastic constants of a cubic crystal from velocity measurements in a single arbitrary direction; application to $SrTiO_3$. J. B. Wachtman, Jr., M. L. Wheat, and S. Marzullo.

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An absolute calibration of the National Bureau of Standards Thermal Neutron Flux. E. J. Axton.

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Infrared spectrum of the $\nu_2-\nu_6$ band of $C^{13}C^{12}H_6$. W. J. Lafferty and E. K. Plyler.

Self-broadening of carbon monoxide in the 2ν and 3ν bands. E. K. Plyler and R. J. Thibault.

Thermodynamic properties of polyethylene predicted from paraffin data. M. G. Broadhurst.

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 Perturbation method in a problem of waveguide theory. D. Fox and W. Magnus. (See above abstracts).
 Some wave functions and potential functions pertaining to spherically stratified media. C. T. Tai. (See above abstracts.)
 Radiation from a plasma-clad axially-slotted cylinder. W. V. T. Rusch.
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 Relative convergence of the solution of a doubly infinite set of equations. R. Mittra. (See above abstracts.)

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- Effects of radio wave propagation through mid-latitude 6300 Å ares. J. R. Roach.
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